REMARKS

The objections to Figures 2 and 3 have been obviated by the concurrent filing of substitute sheets for these drawings appropriately labeled "Prior Art".

The rejection of claims 1-5 and 7-11 under 35 USC §102(b) and claims 6 and 12 under §103 has been obviated by revising independent claims 1 and 7 to more clearly distinguish the invention from the prior art of record. However, before the specific language of the amendment is discussed, a brief recap of the principal features and advantages of the invention will be given so that the language used in the amendment may be more fully appreciated.

As pointed out in the "Background" section of the specification, vehicle rear-view mirrors having an electrochromic layer for darkening reflected images during low light conditions are generally known in the prior art. In some of these prior art electrochromic mirrors, such as that illustrated in Figure 2, the reflective layer 112 is formed from an aluminum electrode and is disposed behind a transparent substrate 102, a transparent electrode 104, and respective layers of iridium hydroxide ($Ir(OH)_3$) 106, tantalum pentaoxide (Ta_2O_5) 108, and tungsten trioxide (WO_3). A glass plate 114 for protecting the aforementioned respective thin films is applied to the side of the aluminum (Al) electrode 112 with a sealer (adhesive) 116. When a voltage is applied between the transparent electrode 104 and the aluminum (Al) electrode 112 by an electric source apparatus 118, the respective thin films of iridium hydroxide ($Ir(OH)_3$) 106 and tungsten trioxide (WO_3) 110 are coloring-reacted to change the reflectivity of the electrochromic mirror 100 (see arrow B of Fig. 2). However, as pointed out in paragraph [0004],

> "unless film thicknesses and film qualities of the aforementioned respective thin films are balanced, a thin film that has been colored once does not revert to its original state in some cases. Moreover, since performance is sensitive to the influence of variations in the respective film thicknesses, difficult manufacturing conditions are imposed. Further, since the multi-layered film is formed by vacuum deposition, there is also a problem of high costs."

In other prior art electrochromic mirrors such as that shown in Fig. 3, an electrochromic solution is used to implement the coloring reaction which reduces the reflectivity of the mirror. Two glass substrates 202 and 204 are disposed parallel at a constant interval, and transparent electrode films 206 are formed on respective internal surfaces facing each other of these two glass substrates 202 and 204. An electrochromic solution 210 is sealed in the interior of a space

(cell) sealed with a sealing agent 208, between these respective transparent electrode films 206. Further, a reflecting film 212 and a protection coating film 214 are formed on the back (lower surface in Fig. 3) of the glass substrate 204. When a voltage is applied between the respective transparent electrode films 206 by an electric source apparatus 216, the electrochromic solution 210 changes color, and the reflectivity of the electrochromic mirror 200 is changed. However, as pointed out in paragraph [0006],

> "unless the two glass substrates 202 and 204 are applied parallel to each other via a sealing agent 206 with high precision, the image of reflected light (see arrow C in Fig. 3) from the reflecting film 212, and the image of the reflected light at a surface (the upper surface in Fig. 3) of the glass substrate 202 are not consistent, and a so-called double image is generated, leading to a mirror which is extremely difficult to see. In particular, a mirror for an automobile generally uses a curved mirror and, in this case, there are the drawbacks that manufacturing is extremely difficult, and costs increase."

The invention is an improved electrochromic mirror that avoids the aforementioned shortcomings associated with the prior art. As illustrated in Figure 1, the mirror of the invention includes a transparent substrate 12, an electrochromic film 14 overlying the back surface of the substrate 12, an electrically conductive reflective layer 16, a second substrate 17 having an electrically conductive layer 22 on its front side, and an electrolysis solution 24 contained within a space formed between the substrates 12 and 18 and sealed by sealing agent 20. The aforementioned novel structure of the electrochromic mirror of the invention has three major advantages over the prior art, as described in paragraphs [0026]-[0028] as follows:

> "...the present electrochromic mirror has a simple construction wherein only two layers of films, namely the electrochromic film and the electrically conductive light reflecting film are formed on the transparent substrate, and the film quality, film thickness and the like of these respective films hardly affect performance. Therefore, this leads to easy manufacturing at low cost."
>
> "In addition, since the electrochromic mirror has such a construction that light introduced into the transparent substrate is reflected by the electrically conductive light reflecting film formed on the back of this transparent substrate, occurrence of a double image is prevented."
>
> "Further, as the electrolysis solution, a highly reactive liquid is generally used in some cases, and the materials used in the electrochromic film such as tungsten trioxide and the like may be dissolved in the electrolysis solution little by little. Even in such a case, in the present electrochromic mirror, since the electrochromic film is formed inside the electrically conductive light reflecting

> film, and is protected by the electrically conductive light reflecting film, it becomes possible to select the electrolysis solution in a wide range."

Claim 1 has been amended to more clearly recite the structural features of the invention that result in the aforementioned advantages of the invention. Amended claim 1 now recites an electrochromic mirror, comprising a transparent substrate, wherein an electrochromic film which is reduction-colored is formed on the back thereof, and an electrically conductive light reflecting film which is permeable to hydrogen atoms is formed "on the back of the electrochromic film," a substrate which has an electrically conductive part having electrical conductivity on at least one side, and is provided in a vicinity of the transparent substrate in a state where the electrically conductive part faces the electrically conductive light reflecting film, and an electrolysis solution which contains at least a hydrogen ion and a material oxidizable with a neutral molecule or an anion, and is sealed between the electrically conductive light reflecting film of the transparent substrate and the electrically conductive part of the substrate,

> "wherein incident light enters said transparent substrate and is transmitted through said electrochromic layer and reflected off of said electrically conductive light reflecting film without being transmitted through said electrolysis solution."

None of the references of record either discloses or suggests the electrochromic mirror recited in amended claim 1. All that the Varaprasad '663 patent discloses is an electrochromic mirror having a transparent substrate 2, a conductive electrode coating 4 overlying the back surface of the substrate 2, an electrochromic solid film 7 overlying the back of the conductive electrode coating 4, a second substrate 3 spaced apart from the film 7 and having a reflective, electrically conductive coating 4' on its front surface, and a liquid electrolyte 6 disposed in the space between the electrochromic solid film 7 and the reflective, electrically conductive coating 4'. The Varaprasad '663 patent expressly teaches that the conductive electrode coating 4 is transparent, while the electrically conductive coating 4' is preferably reflective (see column 17, lines 8-17). Hence the Varaprasad '663 patent implicitly teaches against the recited "electrically conductive light reflecting film" which is permeable to hydrogen atoms,

> "wherein incident light enters said transparent substrate and is transmitted through said electrochromic layer and reflected off of said electrically conductive light reflecting film without being transmitted through said electrolysis solution."

Consequently, the electrochromic mirror disclosed in this reference will include all of the previous shortcomings associated with the prior art, including difficulty of manufacture, the production of double images, and the direct exposure of the electrochromic layer to the potentially corrosive chemicals in the electrolysis solution. For all these reasons, amended claim 1 is clearly patentable over the Varaprasad '663 patent.

As the Beal '517 patent was cited only for its disclosure of an electrolysis solution in the form of a mica gel, no further discussion of this reference is deemed necessary.

Claims 2-6 are patentable at least by reason of their dependency on amended claim 1.

Claim 7 has been amended to include the previously discussed new limitations in amended claim 1, and hence is patentable for all of the same reasons.

Finally, claims 8-12 are patentable at least by reason of their dependency on amended claim 7.

The Examiner should note that claims 1 and 7 have further been amended to recite "a transparent substrate wherein an electrochromic film which ~~is~~ <u>can be</u> reduction-colored is formed on the back thereof". This amendment was made for the purposes of clarifying the definition of the invention, as the former wording "an electrochromic film which **is** reduction-colored" might be construed to mean that the electrochromic film is **always** reduction-colored, which of course is not the case. Support for this amendment is present in paragraphs [0065]-[0075] of the specification.

Now that all of the claims are believed to be allowable, the prompt issuance of a Notice of Allowability is hereby earnestly solicited.

Respectfully submitted,

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